FTR Issues

FTRSTF

October 2, 2014

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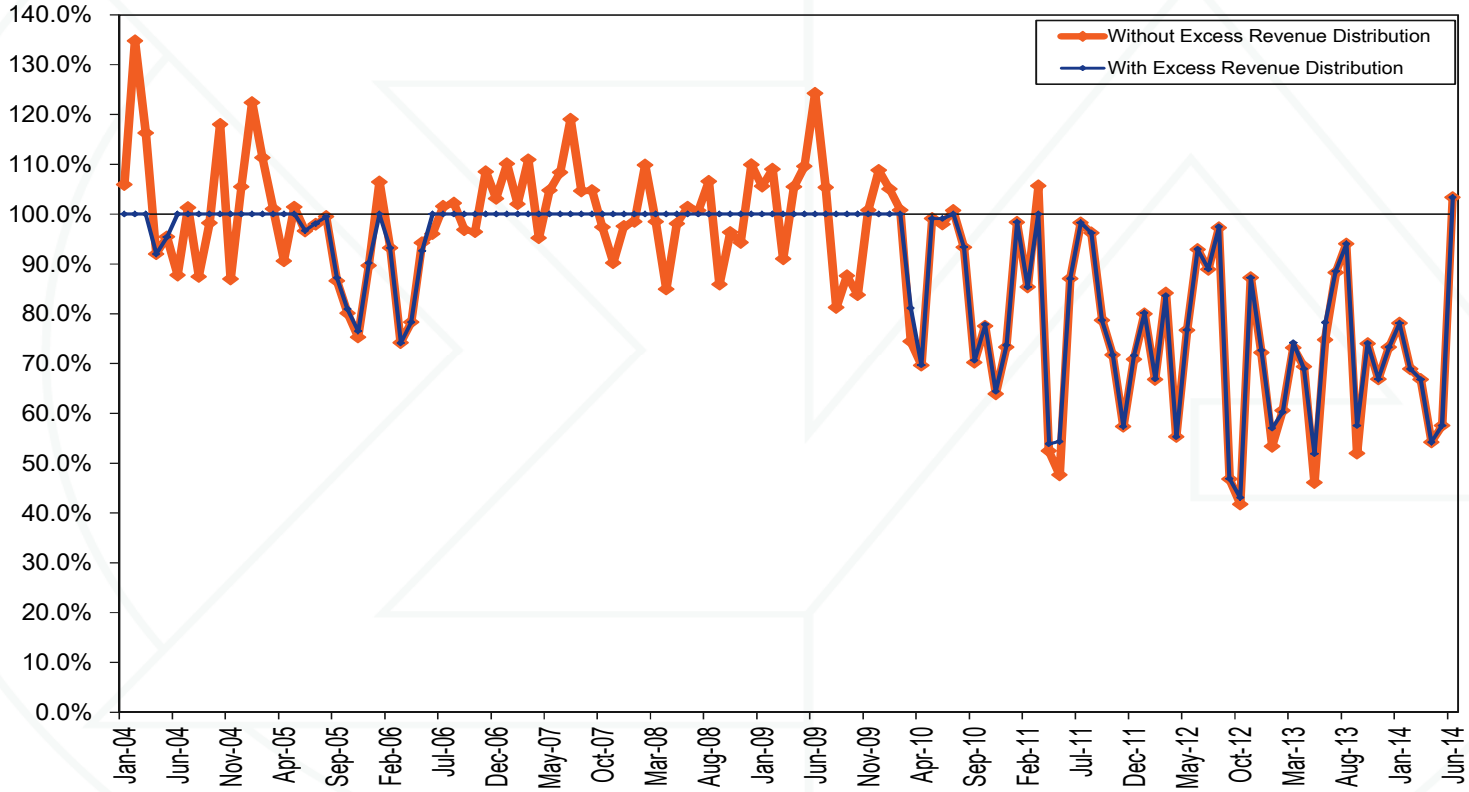
Monitoring Analytics

FTR Revenue Adequacy January 2004 through June 2014



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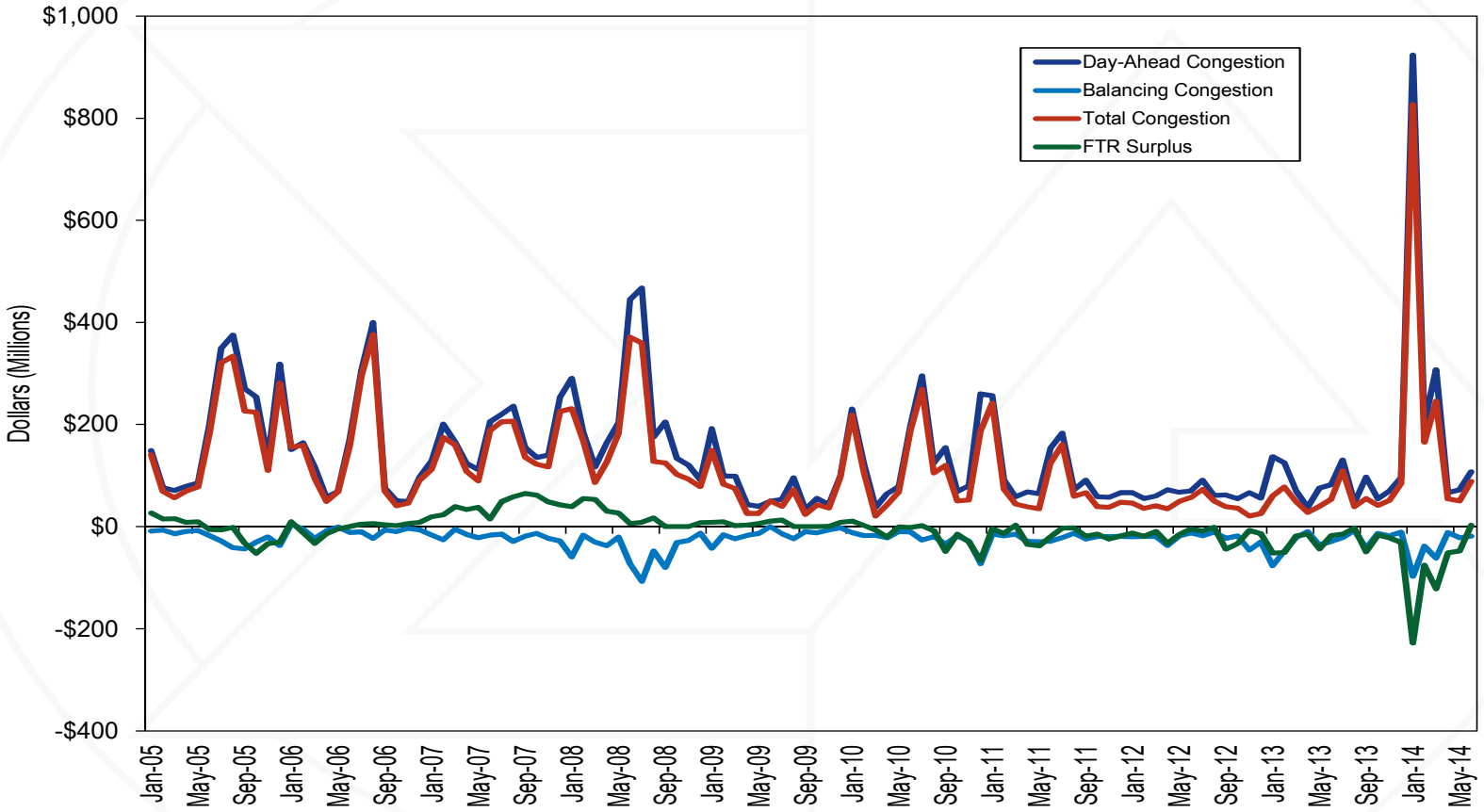
FTR Funding: 2005 through June 2014



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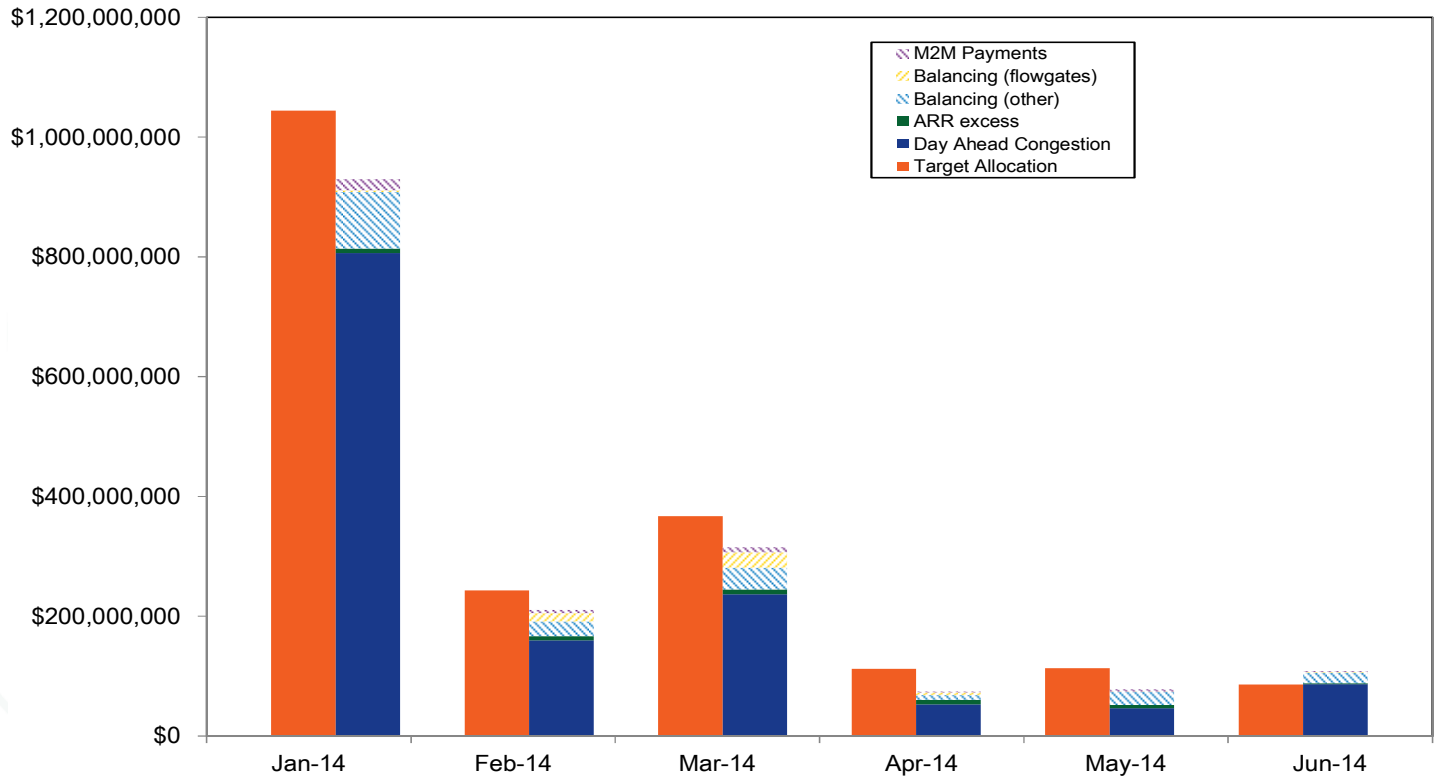
Target Allocation Compared to Sources of Positive and Negative Congestion Revenue



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MMU Proposed Options

1. Report correct monthly payout ratios
2. Eliminate portfolio netting subsidizations
3. Eliminate counter flow FTR subsidizations
4. Eliminate cross geographic subsidies

MMU Proposed Options

1. Improve outage modeling in FTR auctions
2. Reduce FTR availability on persistently revenue inadequate paths/facilities
3. Implement seasonal ARR and FTR allocation methods
4. Eliminate over allocation of Stage 1A ARRs

Reporting of Payout Ratio

- **The monthly payout ratio is not accurately reported**
  - **Uses EOPP calculation instead of revenue actually available**
  - **Should use negative target allocations as a source of revenue, raising the monthly payout ratio**
- **This will not effect funding levels, but is a simple reporting issue to gauge the true level of funding in a month.**

FTR Revenue Adequacy

	Reported Monthly Payout Ratio	Actual Monthly Payout Ratio
Jun-13	78.3%	79.5%
Jul-13	88.8%	89.3%
Aug-13	94.1%	94.7%
Sep-13	57.5%	61.0%
Oct-13	74.1%	76.2%
Nov-13	66.9%	69.1%
Dec-13	73.3%	74.9%
Jan-14	78.1%	78.9%
Feb-14	69.0%	70.7%
Mar-14	66.8%	68.1%
Apr-14	54.2%	55.3%
May-14	57.6%	62.0%
Jun-14	100.0%	100.0%

Elimination of Portfolio Netting

- **Hourly and EOPP uplift calculation is net of positive and negative target allocations**
- **Participants with less negative target allocations subsidize those with more, treating positive target allocation FTRs differently depending on participant's portfolio**

Elimination of Portfolio Netting

- **Subsidization can be eliminated by applying payout ratio to ONLY positive target allocation first, then netting**
- **This was discussed in the 2011 FTR Task Force and received the following votes on its own, but package was voted down**
  - **Vote results: 33 No, 40 Maybe, 43 Yes**

Portfolio Netting Example

	Positive TA Payout
Reported	39.1%
Current Actual	41.7%
Per FTR Actual	61.1%

Participant	Positive Target Allocation	Negative Target Allocation	Percent Negative Target Allocation	Net TA	FTR Netting Payout (Current)	No Netting Payout (Proposed)	Percent Change
1	$60.00	($40.00)	66.7%	$20.00	$8.33	($3.33)	(140.0%)
2	$30.00	$0.00	0.0%	$30.00	$12.50	$18.33	46.7%
3	$90.00	($20.00)	22.2%	$70.00	$29.17	$35.00	20.0%
4	$0.00	($5.00)	100.0%	($5.00)	($5.00)	($5.00)	0.0%
Total	$180.00	($65.00)	-	$115.00	$45.00	$45.00	-

FTR Netting Payout = Net TA * Current Actual = 20 * 0.417

No Netting Payout = (Positive TA * Per FTR Actual) + Negative TA = (60 * 0.611) + (-40)

No Portfolio Netting Payout Ratio

	Net	Per FTR	
Owner	Net TA	Positive TA	Negative TA
1	$20.00	$60.00	($40.00)
2	$30.00	$30.00	$0.00
3	$70.00	$90.00	($20.00)
4	($5.00)	$0.00	($5.00)
Total	$115.00	$180.00	($65.00)

Congestion	Current Available	Per FTR Available
$45.00	$50.00	$110.00

	Positive TA Payout
Reported	39.1%
Current Actual	41.7%
Per FTR Actual	61.1%

- Four FTR holders with a total net of $115 in target allocations
- Total Positive Target Allocations of $180, owed to positive TA holders
- Total Negative Target Allocations of $65, paid to positive TA holders
- $45 in congestion

- Per FTR Available = $45 + $65 = $110
- Payout Ratio = $180/$110 = 61.1%

Portfolio effects of netting

- **Net portfolio results should be equivalent regardless of how they are achieved**
- **This is not the case under the current rules**

$CLMP_A$=\$2 —2MW→ $CLMP_B$=\$15

Total Congestion = \$26

	FTR	Transaction	MW	Price	Cost	TA	Profit Netting	Profit No Netting
Simple FTR	A-B	Buy	10.0	$15.00	$150.00	$130.00	($124.00)	($124.00)
	A-B	Buy	10.0	$15.00	$150.00	$130.00		
FTR Buy and Sell	A-B	Sell	-5.0	$15.00	($75.00)	$0.00	($49.00)	($49.00)
Prevailing and	A-B	Buy	10.0	$15.00	$150.00	$130.00		
Counter Flow	B-A	Buy	5.0	($15.00)	($75.00)	($65.00)	($10.00)	($49.00)

Elimination of Portfolio Netting

	Net Positive Target Allocations	Net Negative Target Allocations	Per FTR Positive Target Allocations	Per FTR Negative Target Allocations	Total Congestion Revenue	Reported Payout Ratio (Current)	No Netting Payout Ratio (Proposed)
Jun-13	$ 86,723,727	$ (4,836,912)	$ 164,066,220	$ (82,101,063)	$64,060,468	78.3%	79.5%
Jul-13	$ 134,302,957	$ (6,017,378)	$ 255,724,128	$ (127,113,708)	$113,548,567	88.8%	89.3%
Aug-13	$ 51,545,380	$ (5,741,003)	$ 104,601,365	$ (58,796,985)	$43,059,687	94.1%	94.7%
Sep-13	$ 126,168,822	$ (10,172,695)	$ 279,972,757	$ (163,977,565)	$66,719,631	57.5%	61.0%
Oct-13	$ 69,748,034	$ (5,779,197)	$ 158,354,017	$ (94,365,761)	$47,353,545	74.1%	76.2%
Nov-13	$ 71,460,441	$ (4,566,566)	$ 156,649,135	$ (89,755,253)	$44,748,426	66.9%	69.1%
Dec-13	$ 123,125,598	$ (7,182,127)	$ 256,139,289	$ (140,195,812)	$84,974,997	73.3%	74.9%
Jan-14	$ 1,081,718,330	$ (37,626,711)	$ 2,042,537,214	$ (998,445,595)	$815,789,461	78.1%	78.9%
Feb-14	$ 257,630,277	$ (14,286,013)	$ 581,660,982	$ (338,316,718)	$167,731,282	69.0%	70.7%
Mar-14	$ 381,568,930	$ (14,281,323)	$ 823,861,546	$ (456,573,940)	$245,465,062	66.9%	68.2%
Apr-14	$ 115,047,446	$ (2,753,503)	$ 255,732,814	$ (143,428,606)	$60,894,528	54.3%	55.4%
May-14	$ 126,329,939	$ (13,141,697)	$ 362,871,684	$ (249,683,438)	$65,163,098	57.6%	62.0%
2012/2013 Total	$ 992,878,752	$ (86,061,137)	$ 1,897,830,880	$ (990,471,801)	$614,014,377	67.7%	84.5%
2013/2014 Total	$ 2,625,369,880	$ (126,385,125)	$ 5,442,171,151	$ (2,942,754,444)	$1,819,508,754	72.8%	87.5%

Earlier Proposals

- **Previous FTR Task Force discussions on balancing congestion reallocation yielded negative results**
- **Previous discussions on the elimination of portfolio netting were positively received**

Funding	7E	Fund FTRs from Day-Ahead Congestion dollars only. The entities charged/credited for Balancing congestion would need to be determined.	FTRs would be funded from day-ahead congestion and auction revenues minus ARR credits. Balancing Congestion which is usually negative would not be used to fund FTRs. The entities charged/credited for Balancing congestion would need to be determined.	77	11	28
Funding	7F	Change end of year uplift and hourly calculation to include all positive target allocations and do not allow negative target allocations to offset positive target allocations within a members portfolio	This would change the hourly and uplift FTR payout calculation so that negative target allocations within a members portfolio cannot be used to offset positive target allocations. Overall funding percentage would be equal among all members. Sell offers would still be able to offset Buy bids within a members portfolio.	33	40	43

Counter Flow FTR Payout Adjustment

- Counter flow FTRs and prevailing flow FTRs are not treated the same
- Current rules insulate counter flow FTRs from any revenue deficiencies, while prevailing flow FTRs have no insulation available
- The payout ratio should be calculated to split revenue deficiencies evenly among all FTRs, counter flow or prevailing flow
- This insulation from underfunding effectively raises the auction prices paid by prevailing flow FTR holders

Negative Target Allocation Counterflow FTRs

If the Total Transmission Congestion Charge is a positive value that is less than the total positive FTR Target Allocation for the hour, then the Transmission Congestion Credit for each market participant is equal to that market participant's FTR Target Allocation multiplied by the Total Transmission Congestion Charge and divided by the Total PJM positive FTR Target Allocations if the market participant's FTR Target Allocation is a positive value, and is ***equal to 100% of the market participant's FTR Target Allocation if the market participant's FTR Target Allocation is a negative value***. Each market participant's hourly Congestion Credit Deficiency is calculated as its FTR Target Allocation minus its hourly Transmission Congestion Credit.

-Manual 28 Section 8.4.3; p51

Counter Flow Adjustment Example #1

Prevailing flow loss; Counter flow profit

Nodal Price A	Nodal Price B	Nodal Price C	Nodal Price D
$ 5.00	$ 10.00	$ 2.00	$ 5.00
CLMP A	**CLMP B**	**CLMP C**	**CLMP D**
$ 7.00	$ 11.00	$ 7.00	$ 5.00

Total Congestion Revenue	Payout Ratio	Actual Monthly Payout Ratio
$ 15.00	75.0%	87.5%

Prevailing Payout Ratio	Counter flow Payout Ratio
91.7%	108.3%

	Prevailing A-B 10MW	Counter C-D 10MW
Auction Cost	$50.00	-$30.00
Target Allocation	$40.00	-$20.00
Payout	$30.00	-$20.00
Profit without underfunding	-$10.00	$10.00
Profit after underfunding	-$20.00	$10.00
Payout for Positive TA	$35.00	-$20.00
Profit for Positive TA	-$15.00	$10.00
Payout after CF Adjustment	$36.67	-$21.67
Profit after CF Adjustment	-$13.33	$8.33
Profit Difference	$1.67	-$1.67

Counter Flow Adjustment Example #2

Prevailing flow profit; Counter flow loss

Nodal Price A	Nodal Price B	Nodal Price C	Nodal Price D
$ 5.00	$ 10.00	$ 2.00	$ 5.00

CLMP A	CLMP B	CLMP C	CLMP D
$ 7.00	$ 13.00	$ 7.00	$ 3.50

Total Congestion Revenue	Payout Ratio	Actual Monthly Payout Ratio
$ 20.00	80.0%	91.7%

Prevailing Payout Ratio	Counter flow Payout Ratio
94.7%	105.3%

	Prevailing A-B 10MW	Counter C-D 10MW
Auction Cost	$50.00	-$30.00
Target Allocation	$60.00	-$35.00
Payout	$48.00	-$35.00
Profit without underfunding	$10.00	-$5.00
Profit after underfunding	-$2.00	-$5.00
Payout for Positive TA	$55.00	-$35.00
Profit for Positive TA	$5.00	-$5.00
Payout after CF Adjustment	$56.84	-$36.84
Profit after CF Adjustment	$6.84	-$6.84
Profit Difference	$1.84	-$1.84

Elimination of Counter Flow Subsidies

	Positive Target Allocations	Negative Target Allocations	Total Target Allocations	Total Congestion Revenue	Reported Payout Ratio*	Total Revenue Available	Adjusted Counterflow Payout Ratio	Adjusted Counter Flow Revenue Available
Jun-13	$164,066,220	($82,101,063)	$81,965,157	$64,060,468	78.2%	$146,161,531	91.9%	$150,770,760
Jul-13	$255,724,128	($127,113,708)	$128,610,420	$113,548,567	88.3%	$240,662,275	95.6%	$244,362,737
Aug-13	$104,601,365	($58,796,985)	$45,804,380	$43,059,687	94.0%	$101,856,672	98.1%	$102,592,928
Sep-13	$279,972,757	($163,977,565)	$115,995,192	$66,719,631	57.5%	$230,697,196	87.3%	$244,550,556
Oct-13	$158,354,017	($94,365,761)	$63,988,256	$47,353,545	74.0%	$141,719,306	92.5%	$146,446,632
Nov-13	$156,649,135	($89,755,253)	$66,893,882	$44,748,426	66.9%	$134,503,679	89.9%	$140,751,323
Dec-13	$256,139,289	($140,195,812)	$115,943,477	$84,974,997	73.3%	$225,170,809	91.3%	$233,817,126
Jan-14	$2,042,537,214	($998,445,595)	$1,044,091,619	$815,789,461	78.1%	$1,814,235,056	91.8%	$1,874,258,807
Feb-14	$581,660,982	($338,316,718)	$243,344,264	$167,731,282	68.9%	$506,048,000	90.9%	$528,451,343
Mar-14	$823,861,546	($456,573,940)	$367,287,606	$245,465,062	66.8%	$702,039,002	89.4%	$736,678,623
Apr-14	$255,732,814	($143,428,606)	$112,304,208	$60,894,528	54.2%	$204,323,135	85.6%	$218,931,616
May-14	$362,871,684	($249,683,438)	$113,188,246	$65,163,098	57.6%	$314,846,537	90.7%	$329,096,401
Total 2012/2013	$1,897,830,880	($990,471,801)	$907,359,079	$614,537,096	67.7%	$1,605,008,896	88.6%	$1,681,443,058
Total 2013/2014	$5,442,171,151	($2,942,754,444)	$2,499,416,707	$1,819,508,754	72.8%	$4,762,263,198	91.0%	$4,950,708,852

Incremental FTRs in a perfect auction model

Existing Prevailing FTR

FTR	Bid Price	Cleared Price
A-B	$ 5.00	$ 5.00

Auction Revenue = $5

Incremental FTR

A → 1MW → B

CLMP = 2

Prevailing FTR +
Profitable CF FTR

FTR	Bid Price	Cleared Price
A-B	$ 5.00	$ 5.00
B-A	$ (6.00)	X

Additional Auction Revenue = $5
CF does not clear
Incremental FTR does not clear

Prevailing FTR +
CF FTR

FTR	Bid Price	Cleared Price
A-B	$ 5.00	$ 5.00
B-A	$ (5.00)	$ (5.00)

Additional Auction Revenue = 0
No net benefit

CLMP = 7

Prevailing FTR +
Unprofitable CF

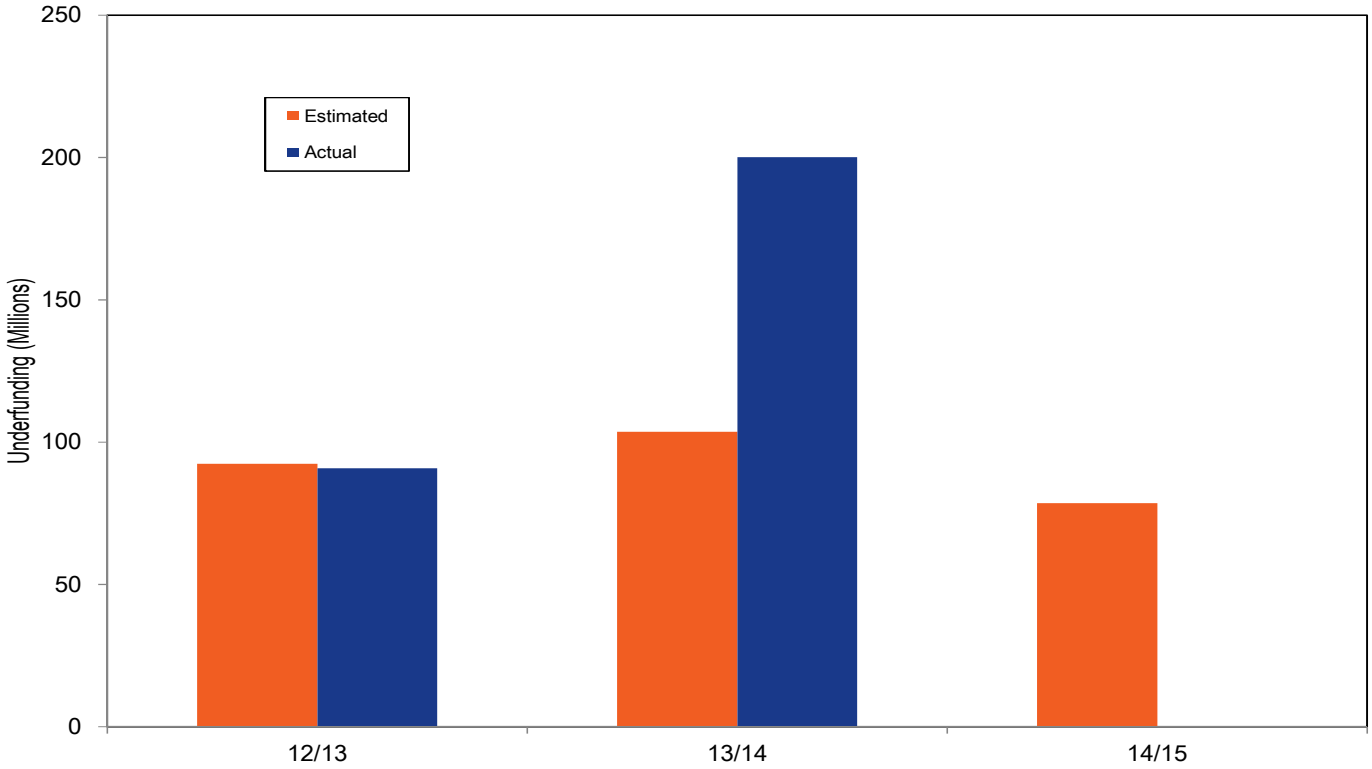
FTR	Bid Price	Cleared Price
A-B	$ 5.00	$ 5.00
B-A	$ (4.00)	$ (4.00)

Additional Auction Revenue = $1

Elimination of Stage 1A Over Allocation Requirement

- **Current rules present scenarios where revenue inadequacy is guaranteed**
- **The ability to prorate Stage 1A ARR allocations to physical facility limits will eliminate this known, preventable revenue inadequacy**

Revenue Inadequacy Due to Stage 1A ARR Over Allocations



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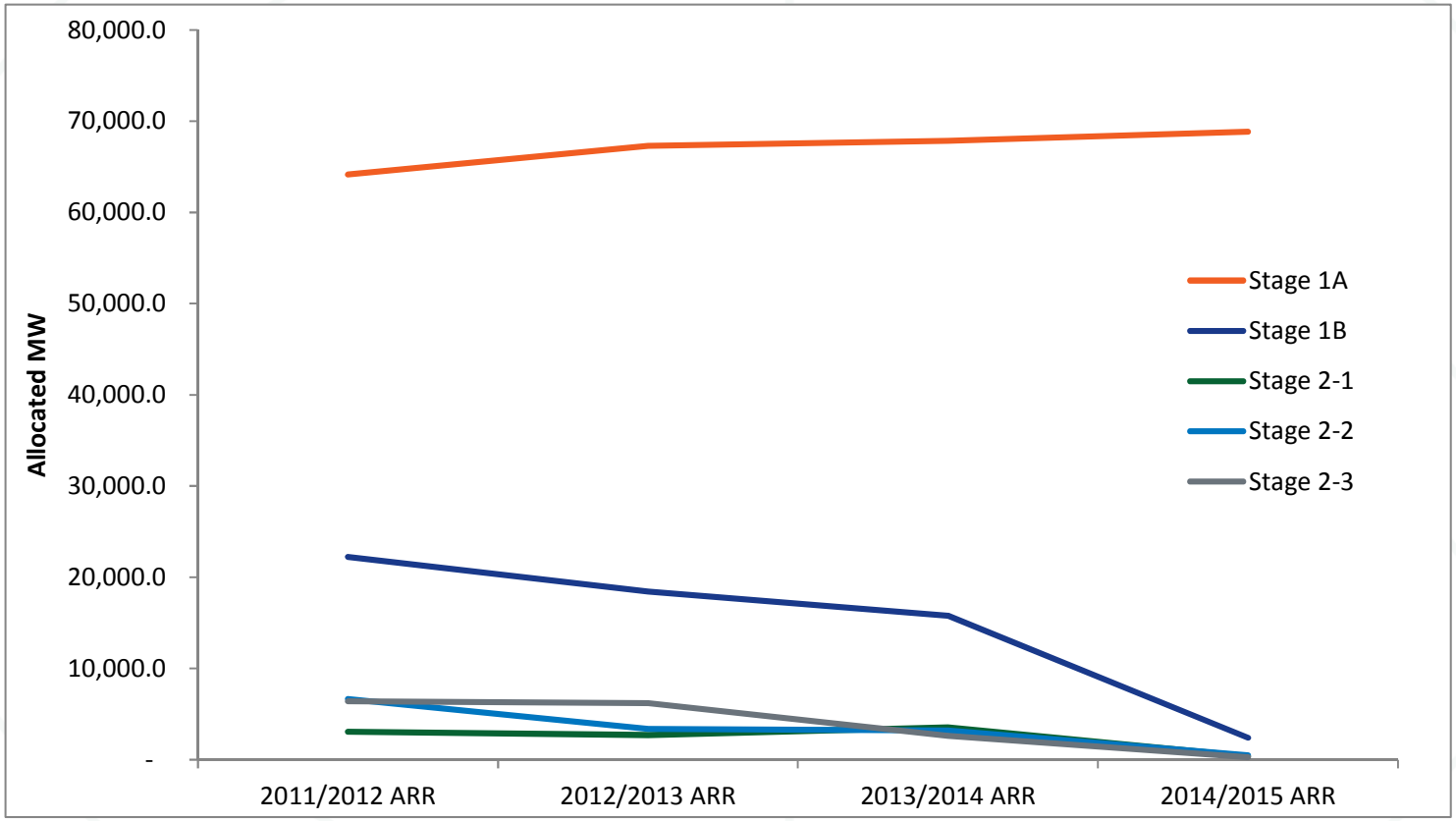
Historic ARR Allocations



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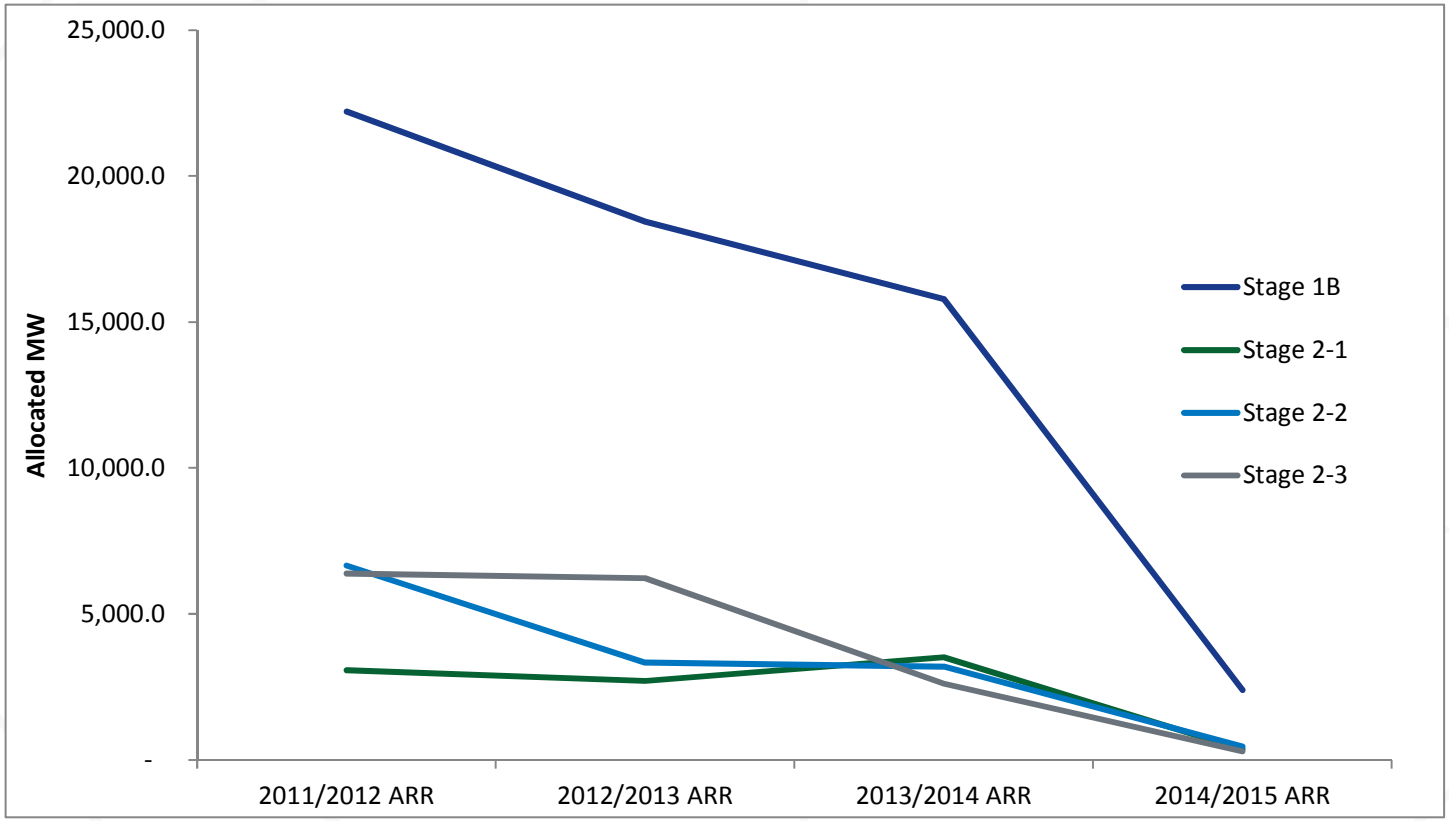

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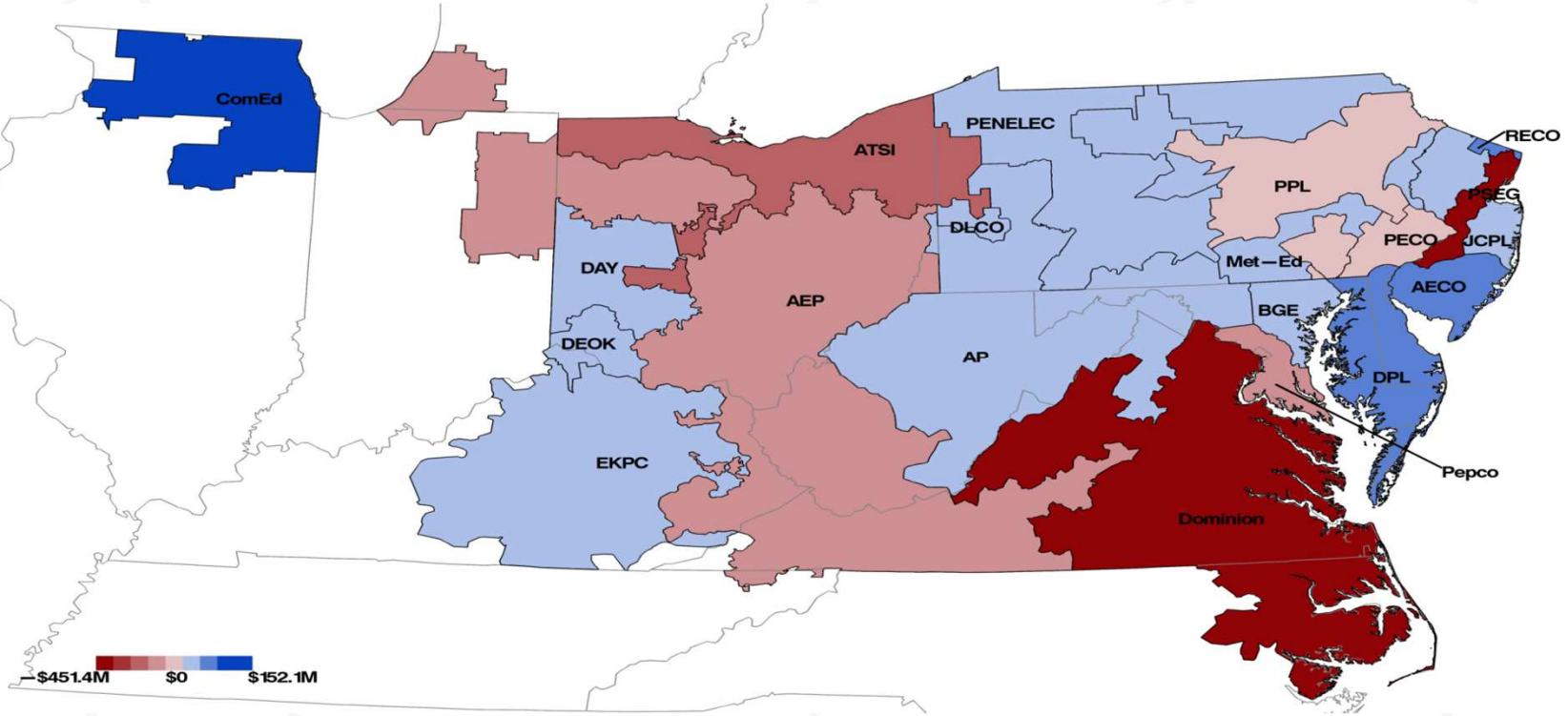
Historic ARR Allocations

Stage	2011/2012 ARR	2012/2013 ARR	2013/2014 ARR	2014/2015 ARR
Stage 1A	64,159.9	67,299.6	67,861.4	68,837.7
Stage 1B	22,208.3	18,431.7	15,782.0	2,389.6
Stage 2-1	3,072.5	2,700.6	3,519.2	360.9
Stage 2-2	6,652.6	3,334.3	3,200.0	455.9
Stage 2-3	6,382.6	6,218.7	2,611.8	291.2

Geographic Cross Subsidies

- **FTRs are not paid on a path specific basis, so geographic subsidies are unavoidable**
- **Zones with excess funding face the same level of FTR funding as the entire FTR market, resulting in zones with excess funding subsidizing zones with a funding deficit**

Geographic Subsidization



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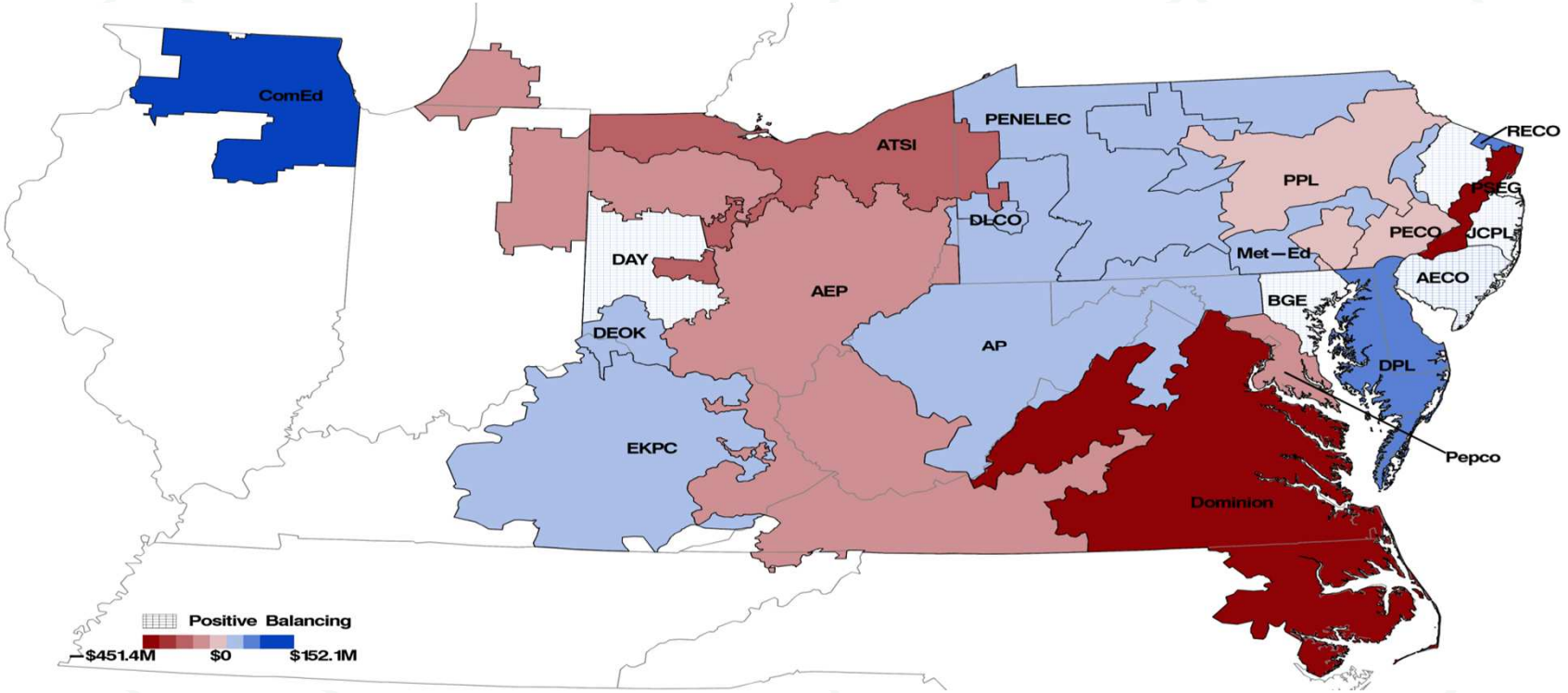
Geographic Subsidization and Balancing Congestion



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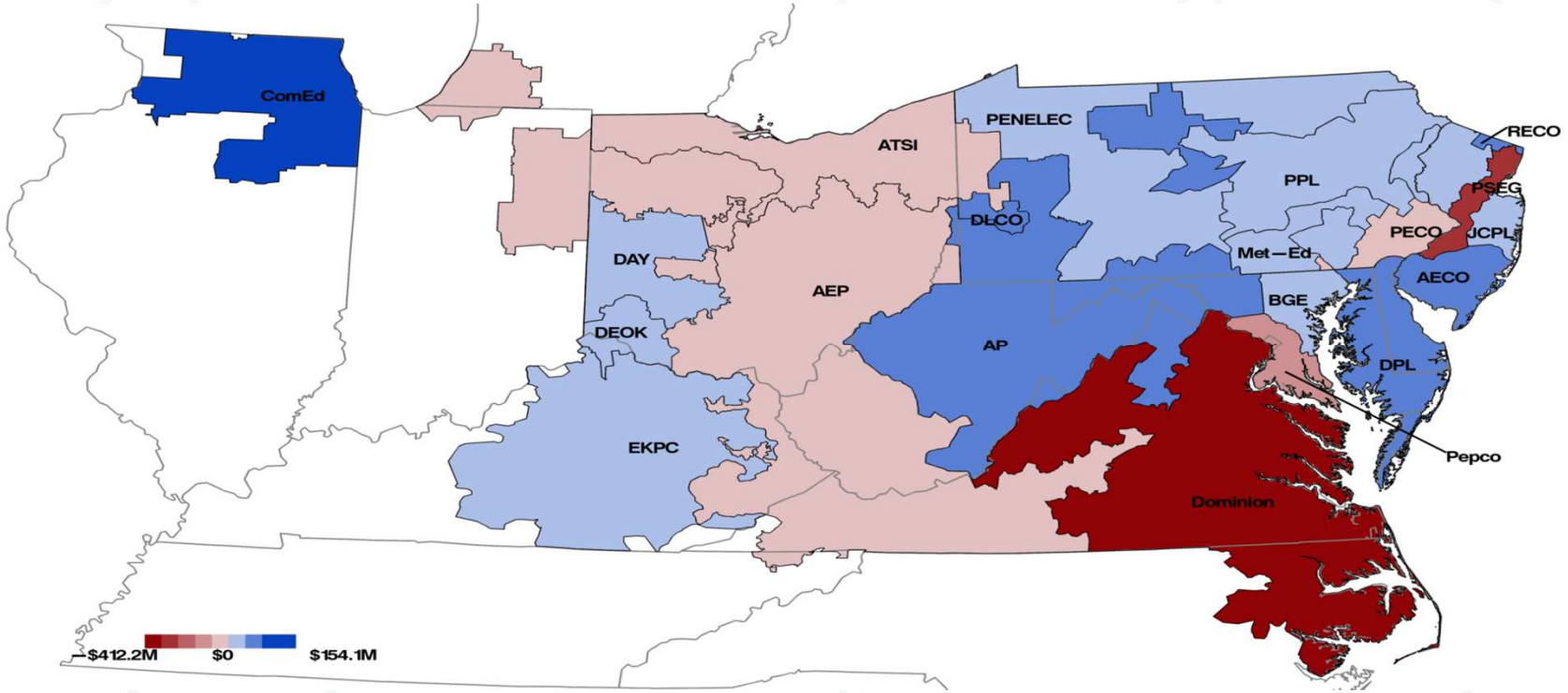
Geographic Subsidization Day-Ahead Only Congestion



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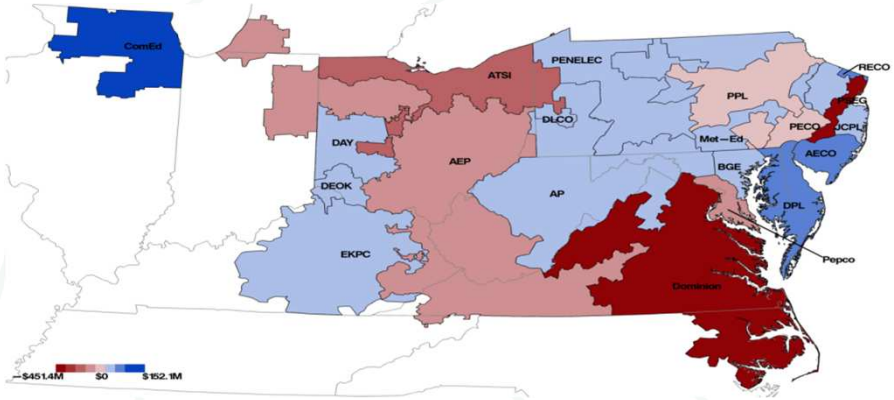
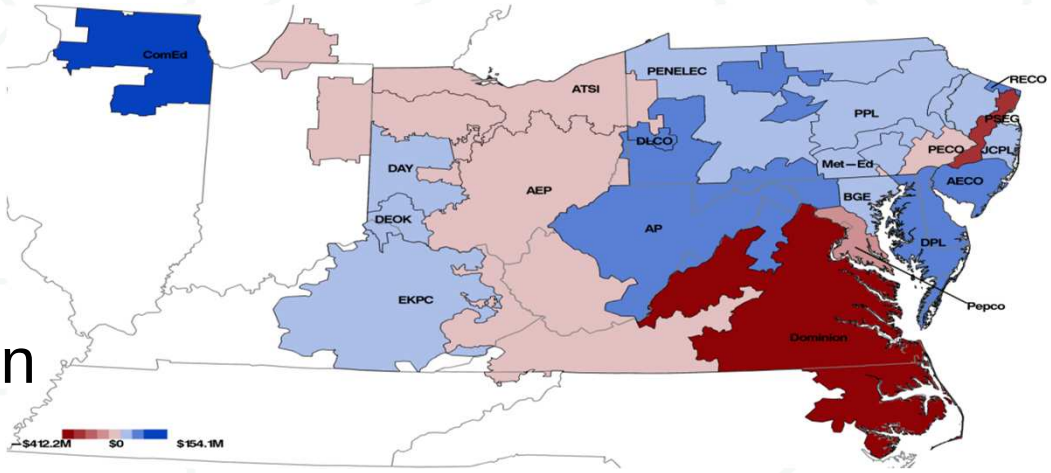
Day-Ahead Only and Total Congestion Comparison



Total congestion



Day-ahead only congestion

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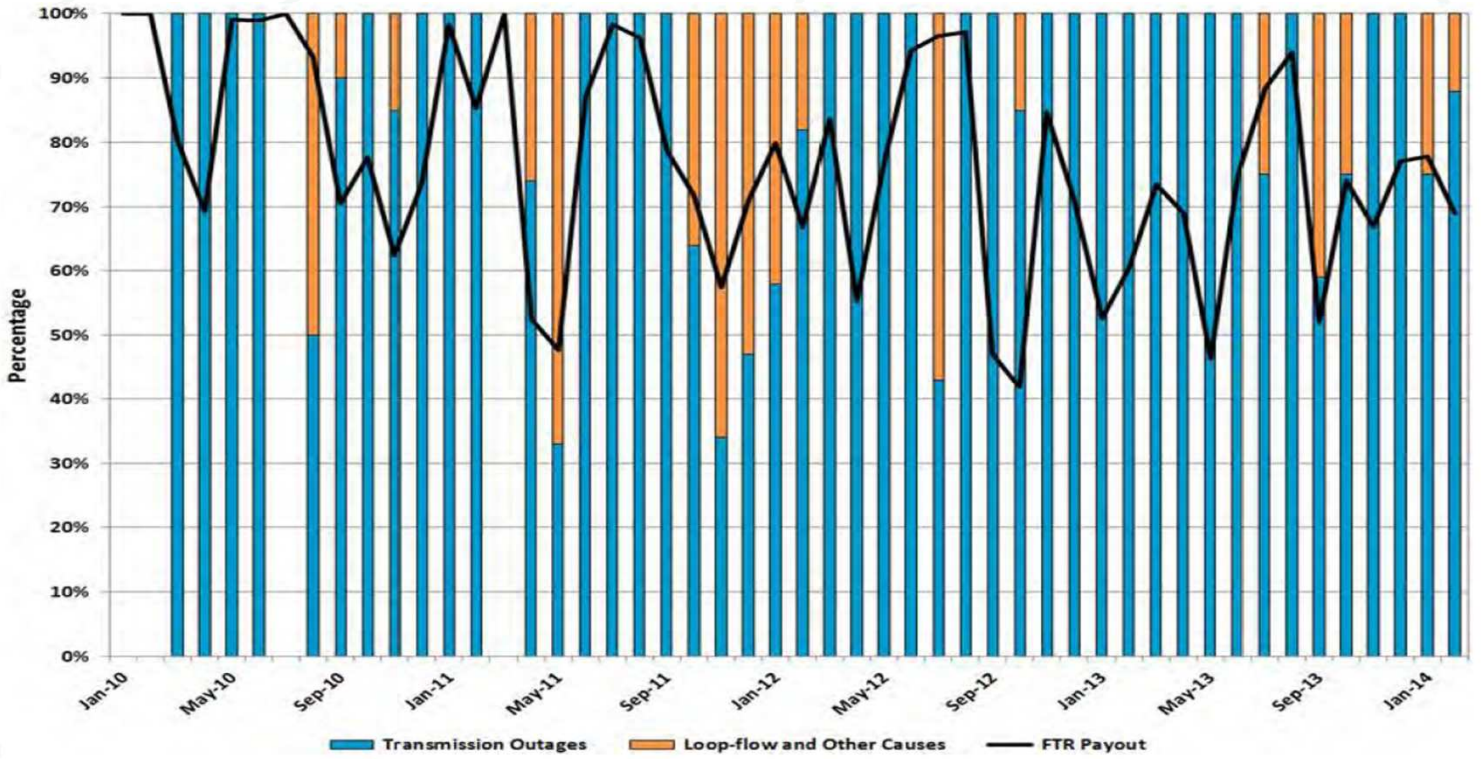
Improved Outage Modeling

- **Deficiencies in outage modeling, especially in the Annual and Long Term FTR Auctions, negatively impact FTR funding**
- **Selling capacity above what is physically available results in a funding deficit**
- **The length of these auctions make it difficult to accurately predict where and when outages will occur**

Impacts of Outage Modeling



MIC Market Operations Report, February 2014.
Website: http://www.pjm.com/~/media/committees-groups/committees/mic/20140305/20140305-item-12a-report-on-market-operations.ashx

Persistently Revenue Inadequate Pathways

- **Facilities, and the paths they impact, that are persistently revenue inadequate can be easily identified**
- **Adjusting the limits on these facilities in the auction models can prevent over selling of the associated FTRs, reducing revenue inadequacies**
- **Clear guidelines on how and when these facilities will be selected and limited must be established**

Seasonal ARR/FTR Allocation

- More granular ARR allocations and FTR auctions would allow more accurate outage modeling
- Done during one clearing period, or throughout the year using average facility limits for the given season
- Allows use of shorter outage periods for better allocation/auction modeling

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